

1 TITLE OF INVENTION:

2 HOSE MANAGEMENT/CONTAMINATION BARRIER DEVICE

3 CROSS REFERENCE TO RELATED APPLICATIONS:

4 Not applicable.

5 STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR

6 DEVELOPEMENT:

7 Not applicable.

8 REFERENCE TO MICROFICHE APPENDIX:

9 Not applicable.

10 BACKGROUND OF INVENTION:

11 1. Field of the Invention:

12 The present invention relates to the management of flexible  
13 hose, flexible hose storage reels, and to flexible hose and  
14 storage reel accessories. More specifically, the present  
15 invention relates to the reduction of the potential for operator  
16 exposure to chemical and other contaminants which may be  
17 conveyed via hose casings to hose storage reel device operators  
18 as they hand-feed flexible hoses back onto storage reels during  
19 the hose retraction process. The present invention further  
20 relates to improving the hose reel operator's ability to more  
21 safely, efficiently and accurately direct flexible hose onto the  
22 storage reel during the retraction process.

23 2. Related Art:

1 Certain application industries, particularly liquid and/or  
2 compressed gas application industries, i.e., those that involve  
3 the delivery of hose-conveyed and/or hose-dispensed liquids,  
4 solids and/or gases, a list of examples might include but shall  
5 in no way be construed to be limited to pesticide applications,  
6 commercial weed control and other herbicide applications, liquid  
7 lawn treatment applications, carpet cleaners, high pressure  
8 cleaners, compressed gas, solvent and lubrication applications,  
9 airport power washers and de-icing equipment, sand blasters,  
10 industrial painters, detergent applicators, pressure lubricating  
11 equipment operations, firefighters, and other service,  
12 manufacturing, application and delivery industries, depend upon  
13 the deployment and retraction of flexible hose during the course  
14 of their respective delivery processes. These hoses are often  
15 and typically deployed at the delivery site from storage reels  
16 and retrieved back onto those reels when the application process  
17 is complete.

18 During the hose retrieval process in manual applications,  
19 the operator usually activates the winding feature of the reel,  
20 whether motor switch or manual crank, with one hand while using  
21 the other hand to direct the inbound hose back  
22 onto the reel. It is primarily during the retrieval process  
23 that the present device provides the greatest protection and

utility by diminishing the potential for a contaminated hose casing to contact the operator's hands, gloves and clothing.

3. Prior Art:

There are U.S. Patents relating to flexible hose management via storage reels, i.e. Pat. Nos. 2,738,143; 2,906,472; 3,176,931, as well as patents on hose design and hose end attachments and application devices. However, no single, similar device is known to have ever been designed to address the specific needs, concerns, purposes, innovations, safety applications, or degree of simplicity and economy as the device described herein. Consequently, the inventor has been unable to discover any related or prior patent art of any kind.

SUMMARY OF THE INVENTION:

The principal object, and not to be construed as an only object, of the present invention is to reduce the potential for operator exposure to chemical residues, fertilizers, animal excrement, herbicides, and any other known or unknown contaminant in residence at an application/delivery environment, or resulting from the application process, may be caused to accumulate on the casing of a flexible hose as it is dragged over or through a contaminated surface, over-sprayed, contaminated by a leak in the hose itself, or otherwise saturated with potentially harmful chemicals, biological

1 hazards, abrasives, or any other known or unknown contaminant  
2 which may accumulate on the hose case during the dispensation,  
3 retrieval and/or manipulation of the hose during the  
4 application/delivery process.

5 Another object of the present invention is to provide the  
6 operator a mechanically safe, effective, inexpensive means of  
7 guiding flexible hose back onto the storage reel with an  
8 improvement of ease, control and accuracy over other known  
9 methods, and to otherwise and generally manage the hose more  
10 effectively in the respective environment.

11 A further object of the present invention is to provide  
12 operators and applicators with a more effective means of  
13 changing, as is frequently necessary, the direction at which  
14 retractable hose is fed onto the reel; e.g., by bracing the  
15 installed device against the angle of resistance, an inbound  
16 hose can be better directed and controlled onto the reel at the  
17 more preferred angle (see Detailed Description of Drawings  
18 **FIG.4**).

19 Yet another object of the present invention is to provide a  
20 mechanical means by which the operator can assist motor-  
21 powered hose retraction devices, in that it provides mechanical  
22 means by which an operator, by camming the opposing inside ends  
23 of the installed device against the hose, may create friction

1 points whereby he can physically push the hose toward the reel  
2 during the hose retraction process, release the device to a  
3 position parallel with the tensioned hose, draw the device back  
4 to the original position and repeat. A mechanical assist is  
5 thereby provided whereby the operator can help a motor-powered  
6 or hand powered retraction device overcome the effects of  
7 inertia,  
8 friction and drag that so frequently encumber the hose  
9 retraction process.

10 The inside diameter of the preferred embodiment is  
11 relatively and uniformly larger at its ends, diminishing and  
12 tapering toward the center. The feature serves to (1) funnel  
13 the hose and fittings into the device at either end with less  
14 friction and (2) create a uniform, non-biting inside radius, on  
15 the occasion the device is used as a direction change for  
16 traveling hose as described in **FIG.4**.

17 It is also an object of the present invention to provide  
18 such a device via simple, inexpensive construction, so as to  
19 avail these objectives to commercial, professional and  
20 domestic consumers at reasonable cost.

21 The foregoing objectives can be accomplished by providing  
22 the hose management/contamination barrier device described  
23 herein.

BRIEF DESCRIPTION OF DRAWINGS:

Refer now to **FIG.1**, which represents a preferred embodiment in accordance with the present invention.

**FIG.2** represents a fragmented view of either end of the preferred embodiment represented in **FIG.1**.

**FIG.3** represents a fragmented view of a more thickly-walled and equally preferred embodiment variation of the embodiment represented in **FIG.1**, permitting beveling or rounding of the inside radii at its ends in lieu of and achieving the benefits of the flared ends depicted in **FIG.1**. **FIG.4** represents a top view of an operator using an embodiment of the device in one of its typical applications.

**FIG.5** describes the device in a user's hand in its typical orientation to the hose 1 contained therein.

**FIG.6** describes the device in a user's hand in an attitude that creates the braking/mechanical assist friction points 2 advantage of the device.

**FIG.7** and **FIG.8** describe the mechanics of how the device can be used as a brake via the friction points or as an assistance to push sections of hose toward the reel during the hose retrieval process, returned to parallel and the original position and repeated as necessary, thereby providing assistance to the take up mechanism of the reel, whether that

1 mechanism be powered by engine, motor, or manually.

2 **FIG.9** and **FIG.10** provide side views of the preferred  
3 embodiments of the present invention, suggesting how a tensioned  
4 hose is contained within the device by the offset installation  
5 and removal slot.

6 **FIG.11** and **FIG.12** describe a hinged or hinge-like  
7 embodiment wherein the device opens, installs on the hose, and  
8 closes around and contains the hose via hinge or hinge-like  
9 molding.

10 **FIG.13** and **FIG.14** describe one of the possible milling or  
11 molding variations for the installation slot described in **FIGS.**  
12 **1,2,3** and **8**.

13 DETAILED DESCRIPTION:

14 As shown in the drawings, the hose management/contaminant  
15 barrier device in accordance with the preferred embodiment of  
16 the present invention includes the formation by machining,  
17 molding, milling, injection molding, or formation by other means  
18 of suitable material(s), including but not construed to be  
19 limited to: injection molded and/or molded and/or milled or  
20 otherwise formed or fabricated plastic, metal, nylon, poly-  
21 vinyl chloride (PVC), acrylonitrile-butadiene-styrene (ABS), or  
22 any other type of sufficiently rigid material into an open-sided  
23 sleeve that is flared, the inside of which is inwardly tapered,

1 and/or rounded or beveled at the inside of either end. The  
2 inside diameter may but not necessarily funnel gradiently and  
3 radially toward the center, the inside diameter at that point  
4 dependent upon the diameter of hose the particular model is  
5 being designed to address, as are the overall length, inside  
6 diameters and other dimensions of the device.

7 Variations in the preferred embodiment of the present  
8 invention may be necessary so as to accommodate specific hose  
9 flexibility and diameter, specific chemical resistance  
10 requirements, degree of user protection and friendliness  
11 requirements, economy of production considerations, some  
12 exemplary descriptions of which are represented in **FIGS.1,9,**  
13 **10,11,13,14.**

14 As suggested in **FIGS.1,2,3,** the inside ends of the present  
15 invention may be flared **1**, radially funneled toward the center  
16 and/or rounded or beveled **2** to assist in the shedding of hose  
17 casing residues away from the operator's hand or glove during a  
18 hose management process, e.g. the hose retraction process  
19 depicted in **FIG.4,** as well as to channel  
20 the hose into the device under less friction and potential for  
21 snagging than might be expected from other embodiments of the  
22 same device with less finished or non-funneling inside edges.

23 The more acute ends of the installation slot **4** in **FIGS.**



1 **1,2,3** needn't be finished. They are, however, rounded in the  
2 preferred embodiments in the interest of operator safety and the  
3 minimization of the potential for hose damage, snagging and/or  
4 the potential for fitting hang up due to an exposed corner or  
5 edge, particularly relevant to applications wherein it is  
6 specified that the device be fashioned or milled from metal.

7 The installation slot in the hose management  
8 device/containment device described in **3** in **FIGS. 1,2,3** and  
9 further depicted in **FIGS.9,10,11,13,14** shall be of a width  
10 sufficient to install the device on to the various hose  
11 diameters that the differing models may be designed to  
12 accommodate. The installation slot **3** in **FIGS.1,2,3,11,12,13, 14**  
13 of these examples  
14 is milled or molded so as to open the length of the device  
15 thereby allowing the device to be easily installed onto the hose  
16 via fixed opening, e.g. **1** in **FIGS. 9,10,11,13,14** or via hinged  
17 collar, **FIGS.11** and **12**. The installation slot already described  
18 may be parallel with the central axis of the device, however the  
19 preferred orientation of same is (with the exception of  
20 **FIG.11,12** wherein the hose containment problem is solved by  
21 complete enclosure) oblique by design, thereby creating offset  
22 entry and exit shoulder points so as to help insure hose  
23 containment within the device during its employment, a typical

1 application of same described in the drawing of the retraction  
2 process **FIG.4**.

3 **FIG.4** describes an operator employing the device in a  
4 typical application, wherein **1** is the an inbound hose traveling  
5 toward and being directed onto a storage reel **2** by the device **3**  
6 in the hand of the user **4**.

7 By the user changing his hand from the running attitude of  
8 the device **FIG.5** the hose gripping attitude of the device **FIG.6**,  
9 the opposing inside ends of the device may, by the user, be  
10 leveraged against the hose **1** so as to create friction points **2**,  
11 whereby the operator can use the device to afford himself  
12 convenience in pulling hose from the reel, as a braking  
13 mechanism to slow and/or prevent hose overruns on to the reel  
14 and, in the case of an inbound hose, as an assistance in pushing  
15 the hose toward the reel during the retrieval process as per **1-**  
16 **3, 4-7** in

17 **FIG.7**. Referring still to **FIG. 7**, the device may then be  
18 returned to parallel **4**, drawn back to  
19 the original position **5** to gain another purchase via friction  
20 points **2**, and repeated as required **1-3,4-5,1-3**, etc. The action  
21 provides an effective means of overcoming friction due to the  
22 resistance, friction and drag which often overcome the reel's  
23 power source to retrieve a fully deployed hose, a condition that

1 frequently encumbers the hose retraction process.

2 **FIGS. 9,10** describe the preferred embodiments of the device  
3 installed on a hose 1 via the expansion slot 3 and contained by  
4 the diagonally opposed shoulder points 2.

5 **FIGS. 11,12** describe a hinged or hinge-like embodiment of  
6 the device wherein one long axis side of the device is connected  
7 via hinge or flexible molding, allowing the opposite side 3 to  
8 be opened so as to allow this embodiment of the device to  
9 receive the hose 1 and then closed to contain the hose 2,  
10 thereby affording the user the advantages and containment  
11 protections of the oblique slot embodiments described in the  
12 patentor's claims, descriptions, and elsewhere herein.

13 **FIGS. 13,14** describe embodiments of the device wherein  
14 the hose containment advantage of the off-axis installation slot  
15 angle is achieved by slot lines that are essentially parallel to  
16 the long axis of the device 3 but that originate from points on  
17 either end of the device that are slightly  
18 offset from one another 2, thereby creating the same and  
19 desirable hose containment effect of the more obliquely designed  
20 installation slots described for the preferred embodiment and  
21 other embodiments of the device already and thoroughly  
22 described.

23 *sub a2* ~~THE FOREGOING DESCRIPTION OF THE PREFERRED EMBODIMENTS AND~~

1 OTHER EMBODIMENTS OF THE INVENTION HAVE BEEN PRESENTED FOR THE  
2 PURPOSES OF ILLUSTRATION AND DESCRIPTION ONLY. THEY ARE NOT  
3 INTENDED TO BE EXHAUSTIVE OR TO LIMIT THE INVENTION TO THE  
4 PRECISE FORMS DISCLOSED, NOR IS IT TO BE IMPLIED BY THE  
5 FOREGOING DRAWINGS OR DESCRIPTIONS THAT THE DEVICE BE LIMITED TO  
6 FLEXIBLE HOSES OR MANUAL, HANDHELD OPERATIONS. MANY  
7 MODIFICATIONS AND VARIATIONS ARE POSSIBLE IN LIGHT OF THE ABOVE  
8 TEACHING. IT IS INTENDED THAT THE SCOPE OF THE INVENTION BE  
9 LIMITED NOT BY THESE DETAILED DESCRIPTIONS, BUT RATHER BY THE  
10 CLAIMS APPENDED HERETO.

11       ALTHOUGH THE TEXTUAL DESCRIPTION OF THE DEVICE DESCRIBES  
12 ITS APPLICATION TO FLEXIBLE HOSES AND HOSE STORAGE REELS ONLY,  
13 THE INVENTOR HEREBY NOTICES THAT THE DEVICE AND/OR VARIATIONS OF  
14 ITS EMBODIMENTS MAY AFFORD ONE OR MORE OF THESE ADVANTAGES IN  
15 THE MANAGEMENT OF ANY FLEXIBLE, LINEAR, TUBULAR, LINKED,  
16 BRAIDED, WOUND OR SOLID CONNECTING, RETRIEVAL OR DELIVERY MEANS  
17 EXAMPLED BY BUT NOT TO BE CONSTRUED TO BE LIMITED TO:  
18 STEEL CABLE; WIRE ROPE; ELECTRICAL CABLE AND CORD; FIBER OPTICAL  
19 CABLE; ANY AND ALL TYPES, WEAVES, STRANDS AND BRAIDS OF NATURAL  
20 AND SYNTHETIC ROPES, TWINES AND LINES; CHAIN MOTOR CHAINS; CHAIN  
21 AND/OR ANY LINKAGE OR CONNECTION DEVICE THAT CAN BE DEFINED OR  
22 EMPLOYED AS CHAIN; HOME, GARDEN, INDUSTRIAL AND COMMERCIALY  
23 EMPLOYED WATER HOSES, AND ANY OTHER FLEXIBLE, LINEAR, DISPENSING